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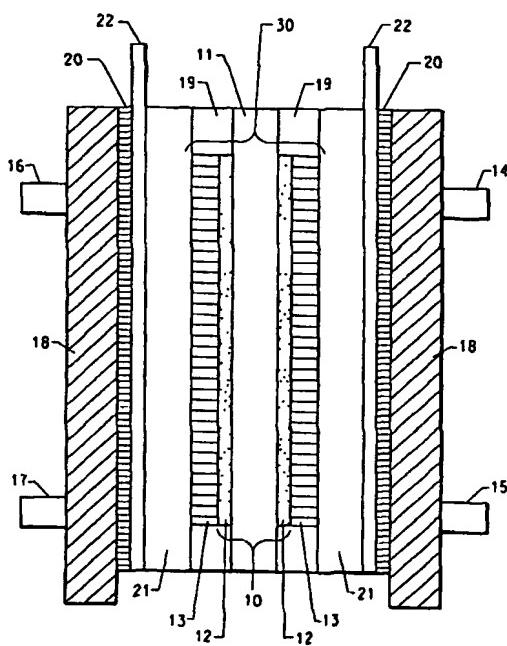
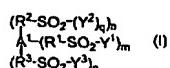
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[Continued on next page]

(54) Title: SULFONIMIDE CONTAINING COMPOUNDS AND THEIR USE IN POLYMER ELECTROLYTE MEMBRANES FOR ELECTROCHEMICAL CELLS



(57) Abstract: A compound having the general structure (1), wherein A^1 is a monovalent, divalent, or trivalent aromatic heterocyclic group comprising heterocyclic rings; R^1 , R^2 , and R^3 are divalent fluorinated groups; m , n , and p are 0 to 3, with the proviso that $m + n + p$ is equal to 1, 2, or 3 so that the carbon atoms of the heterocyclic rings are fully substituted by acidic fluorinated sulfonyl-containing groups; q is 0 or 1; Y^1 is $-\text{OH}$, $-\text{NH}-\text{SO}_2-\text{R}^4$ wherein R^4 is a monovalent fluorinated group, $-\text{NH}-$, $-\text{NH}-\text{SO}_2-\text{R}^5-\text{SO}_2-\text{NH}-$, or $-\text{NH}-\text{SO}_2-\text{R}^6-\text{A}^2-\text{R}^7-\text{SO}_2-\text{NH}-$, wherein A^2 is a divalent heterocyclic group and R^5 , R^6 , and R^7 are divalent fluorinated groups; and Y^2 and Y^3 are $-\text{OH}$ or $-\text{NH}-\text{SO}_2-\text{R}^4$; with the proviso that when m and n are each equal to 1, p is 0 to 1, and q is 0, Y^1 is selected from the group consisting of $-\text{NH}-$, $-\text{NH}-\text{SO}_2-\text{R}^5-\text{SO}_2-\text{NH}-$, and $-\text{NH}-\text{SO}_2-\text{R}^6-\text{A}^2-\text{R}^7-\text{SO}_2-\text{NH}-$. By compound is meant either a small molecule or a repeat unit of a polymer. The invention also provides a solid polymer electrolyte membrane, a membrane electrode assembly, a gas diffusion electrode, an electrocatalyst coating composition, and a fuel cell.



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